FOREWORD

BY THE SECRETARY OF STATE FOR THE ENVIRONMENT

As we push out the boundaries of our knowledge we become ever more amazed at the variety and diversity of life which this planet sustains. That wonder ought to be mixed with fear, as we become more aware of the delicacy of the balances upon which our very existence depends.

It is no longer possible to pretend that we can snatch for ourselves, or for this generation, everything that the earth affords. We cannot pay for our development out of our children's purses. What decent parent would knowingly grow rich at their child's expense?

So the concept of ensuring that we develop only within strategies which safeguard the future is one which strikes a chord with everybody. There is nothing outlandish or extreme about it. Sustainable development simply means growing in ways for which future generations will thank us. It does not mean being against development. That would do our grandchildren no favours. It means instead developing in such a way that we respect the delicate balances on which our lives depend, and protect and enhance the great variety in which nature abounds.

In this the whole world needs to work together. We are committed to a strategy for sustainable development. In the United Kingdom we want that strategy to be developed with the widest consensus. I want to hear views from local government, industry and business, academics, scientists, voluntary groups and individuals from all over the UK about the issues raised in this consultation paper. We can then use all that information and resource to pass on a sound economy and a safe, healthy environment to our children and grandchildren.

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UK STRATEGY FOR SUSTAINABLE DEVELOPMENT CONSULTATION PAPER

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PREFACE

CONSULTATION PROCESS

1. This consultation paper seeks to provide a focus for continuing public debate about the preparation of a UK Strategy for Sustainable Development, on which a report is to be made to the new United Nations Commission on Sustainable Development by the end of 1993.

2. As part of the consultation process, the Department of the Environment (DOE) wrote to about 180 organisations and individuals in November 1992, inviting comments on the scope and content of the Strategy. About 70 responses have been received. 200 consultation letters were also sent out by the Scottish Office and 24 by the Welsh Office, and about 40 and 8 responses respectively have been received.

3. Subsequently, a draft framework for the Strategy was drawn up and formed the basis for a number of meetings between the DOE and other organisations. A seminar was organised in Oxford in March 1993, involving about 100 organisations and individuals from all parts of the UK, to encourage further debate on sustainable development. A copy of the proceedings of this seminar, including the Strategy framework, has been widely circulated.

4. This consultation paper now provides a more detailed outline of the Strategy and sets out the main topics likely to be covered. It takes on board many of the comments made in response to the earlier consultations and, in turn, will provide the basis for further consultations. Responses are therefore invited on all or any of the issues raised and especially on the main themes identified in Section 5.

FRAMEWORK FOR THE CONSULTATION PAPER

5. This consultation paper is divided into five main Sections, following the Sections which it is intended the Strategy itself will cover:

1) **Introduction**: sustainable development in the UK and key principles;

2) **Environmental media and resources**: now and projected forwards over 20 years on current policies;

3) **Economic activities and sustainability**: the interrelationships between economic development in the major sectors of the economy and their impact on the environment;

4) **Putting sustainability into practice**: the way in which different organisations and individuals can contribute to sustainable development and the way in which sustainable development strategies can be implemented;

5) **Conclusions.**

WHERE TO SEND RESPONSES

6. Please send two copies of your response by 30 September to:

Ms Claire Brialey, Department of the Environment, Room A.124, Romney House, 43 Marsham Street, London SW1P 3PY.

7. Those in Scotland, Wales or Northern Ireland are asked to send an additional copy, as appropriate, to:

Mrs Linda Lorimer, Scottish Office, Room 273A, 27 Perth Street, Edinburgh EH3 5RB.

Gerry Quarrell, Welsh Office, Environment Division, Cathays Park, Cardiff CF1 3NQ.

Michael Sands, DOE (Northern Ireland), Environment Service, Calvert House, 23 Castle Place, Belfast BT1 1FY.

8. It is the Government's practice to make responses to consultation papers available to Parliament and for public inspection in its libraries. Unless you specifically indicate that your response is to be kept confidential, DOE will assume that you have no objection to its being made publicly available.

9. Further copies of this consultation paper can be obtained from:

Department of the Environment	: 071 276 8766.
Scottish Office	: 031 244 2926.
Welsh Office	: 0222 823180.
DOE for Northern Ireland	: 0232 230560.

SECTION 1 : INTRODUCTION

THE EARTH SUMMIT

1.1. The concept of sustainable development was central to the United Nations Conference on Environment and Development (UNCED), popularly known as the Earth Summit, held in Rio de Janeiro in June 1992. One of the principal outcomes of the Conference was the establishment this year of a Commission on Sustainable Development (CSD) under the aegis of the UN, to monitor progress in implementing the agreements reached in Rio.

1.2. A second outcome was a general endorsement of Agenda 21, a comprehensive and forward looking action plan for the next century. Agenda 21 calls on governments to prepare national strategies for sustainable development. It also calls for reports to be submitted to the new Commission regarding the actions being taken to implement Agenda 21, the problems faced and any other relevant environment and development issues. The Commission will in turn report to the UN General Assembly on the reports and action to implement Agenda 21.

1.3. As part of their follow-up to UNCED, European Community (EC) member states made a commitment at the European Council meeting in Lisbon in June 1992 to produce national action plans for the implementation of Agenda 21 by the end of 1993; a similar commitment was made by G7 countries at the G7 Munich summit in July 1992. The UK Strategy for Sustainable Development is intended to meet these commitments; it will also be submitted, in summary form, as our national report to the CSD.

1.4. The Sustainable Development Strategy is not the only commitment which the UK accepted at UNCED: the Government will also prepare plans this year on climate change, on biodiversity and on forest principles. Cross references will be found at appropriate places in the Sustainable Development Strategy.

SUSTAINABLE DEVELOPMENT AND THE UK

1.5. For the purposes of the current Strategy, the Government proposes to start from the widely accepted definition given in the 1987 Report of the World Commission on Environment and Development - the Brundtland Report - that sustainable development is:

> "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

1.6. This concept is not new in the UK. Environmental priorities, including the principle of sustainability, are already an integral part of much of current policy and practice. In 1989, the Government produced a progress report on implementing sustainable development. This report, *Sustaining our Common Future*, was a first attempt to set out policy aims and measures for the UK specifically directed towards achieving sustainable development.

1.7. This theme was incorporated in the UK's first comprehensive White Paper on the Environment, *This Common Inheritance*, in 1990 and followed through in the First and Second Year Reports on the White Paper:

> "The Government therefore supports the principle of sustainable development. This means living on the earth's income rather than eroding its capital. It means keeping the consumption of renewable natural resources within the limits of their replenishment. It means handing down to successive generations not only man-made wealth (such as buildings, roads and railways) but also natural wealth, such as clean and adequate water supplies, good arable land, a wealth of wildlife and ample forests."[1]

1.8. The Sustainable Development Strategy will build on this earlier work and broaden the consideration to take on board the new material and ideas generated by the Earth Summit. In particular, the Strategy will seek to look further forward than in previous White Papers, to the year 2012, 20 years beyond the Earth Summit. (The Earth Summit was itself 20 years after the pioneering UN Conference on the Human Environment held at Stockholm in 1972).

1.9. The Government does not intend to prepare a Strategy for sustainable development each year; this would be neither necessary nor appropriate although the CSD called for reports on selected topics each year. This year's Strategy will provide an opportunity to involve all sectors of society in considering what sustainable development means for the UK. It will aim to encourage and stimulate decision makers in the public and private sectors, as well as individuals, to adopt a sustainable approach throughout all their activities.

1.10. While the Government does not see a need for an annual strategy on sustainable development, it will continue to produce annual White Papers on the Environment to monitor progress on the environment and on sustainability issues.

SCOPE OF THE STRATEGY

1.11. Agenda 21 is a global plan, taking account of the different needs of developed and developing countries. Since economic development in the UK affects the economy and the environment of other countries, it will be necessary to consider the impact of UK policy and practice on other parts of the world - our international "footprint". This will include the impact which the UK, like other countries, has on the developing world and other areas such as Central and Eastern Europe and the former Soviet Union. The UK Strategy for Sustainable Development will also consider sustainable development in the context of our Dependent Territories.

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[1] Para. 4.4. *This Common Inheritance. Britain's Environmental Strategy*. September 1990. Cm 1200.

1.12. The UK is, of course, affected by other countries' policies and practices and this may need to be brought out in the Strategy. The Strategy will take into account policy and practice in the EC and references will be included where appropriate to the action envisaged in the EC's Fifth Environmental Action Programme.

1.13. While sustainable development is a global aim, the main geographical focus of the current Strategy will be on the UK economy and the UK environment. There will not be separate chapters on Scotland, Wales and Northern Ireland although there will be references to geographical differences and similarities. Immediate or short term local environmental concerns such as litter and noise which are dealt with in the White Papers on the Environment do not warrant the same coverage in the Sustainable Development Strategy.

THE PRINCIPLES OF SUSTAINABLE DEVELOPMENT

1.14. In taking the Brundtland definition as a starting point, the Government recognises that people aspire both to economic development with rising standards of living and to a safe and pleasant environment; and that they wish to pass these on to future generations. It does not mean the preservation of the environment at all costs nor does it mean that development must always have priority because of its importance for wealth and job creation.

1.15. Economic development is needed to raise the living standards of the present population and of future generations alike. It can, for example, provide better health care, education and recreational facilities; it also provides the income from which we can increase our spending on environmental protection and improvement and hence our environmental capital.

1.16. It is important to recognise that there are many ways of combining economic activity with environmental protection which secure the best of both worlds. These include energy efficiency measures, improved technology and techniques of management, better product design and marketing, waste minimisation, environmentally sensitive farming practices, sound decisions in land use planning, improved transport efficiency, informed choices by consumers and changes in individual lifestyles.

1.17. However, as the 1990 White Paper on the Environment put it (para. 1.5):

> "Growth is a necessary though not a sufficient condition for achieving the higher quality of life that the world wants".

For economic development to continue - that is, to be sustainable development - it must be development that is compatible with the environment in which we live. Sustainable development requires changes both in the way economic activity is conducted and in the lifestyles of individual citizens.

1.18. To some extent it is inevitable that economic development will affect the environment: it uses natural resources, and it produces by-products such as pollution and waste. This is acceptable when the benefits outweigh the environmental costs but there are times when a feature of the environment needs to be treated as inviolable.

1.19. Assessing the balance of benefits and costs between enhancement of man-made capital and conservation of environmental capital is not an easy task: sometimes the consumption of resources or the by-products of pollution and waste may have delayed consequences in the long run; some effects may be irreversible, such as the depletion of natural resources in limited supply, the loss of species or the destruction of heritage sites; and some effects may be uncertain because not enough is known about the scientific processes involved. Different countries may have different perceptions of that balance which may have consequences for their actions affecting the UK.

1.20. Decisions about levels of protection should be based on the best possible economic and scientific analysis. Risk assessment is one of the great challenges in sustainable development policy: the best available science is required to identify the hazards and their potential consequences, and to weigh up the degree of uncertainty. Where appropriate (for example, where there is uncertainty combined with the possibility of the irreversible loss of valued resources), actions should be based on the so-called "precautionary principle" if the balance of likely costs and benefits justifies it. Even then the action taken should be in proportion to the risk.

1.21. The processes of public decision taking, in central government and local councils and other public bodies, should therefore provide for proper assessment of the issues and for environmental appraisal before action is taken; the balance of likely costs and benefits must be established. In the long run, work on natural resource accounting or "green accounts" may help. Where quantifiable measures are not available the next best analysis must be made: implicitly, values are placed upon aspects of the environment when, for example, measures are taken to reduce threats to global atmosphere or to avert threats to health or to conserve scarce resources of minerals or of landscape.

1.22. It is also important that the private sector takes account of the full environmental costs - the "polluter pays principle". Economic instruments are designed to achieve environmental objectives by making the true costs of actions transparent to decision makers. There are many situations now in which economic instruments are more effective in this way than environmental regulation and in the 1992 White Paper on the Environment, the Government expressed a general presumption in favour of using economic instruments (para. 3.46). Regulation will remain an important instrument of environmental protection, but the Government is currently reviewing the scope for reducing or simplifying the detail of environmental regulation, where possible, as part of its deregulation initiative.

1.23. Apart from public and corporate decisions, there is also a need to encourage individuals to understand better the principles of sustainable development and to take account of environmental costs in their private lives. Increasingly people are aware of this need and committed to it, but they often want better information.

1.24. This brief discussion of principles raises many issues. In particular, the Government would welcome responses which focused on:

> **1) the scope of the Strategy (the balance of local, national and global issues; the time horizon; the choice of economic sectors; the identification of environmental media and resources and so on);**
>
> **2) the key concepts and principles inherent in sustainable development that should inform and guide decision makers in the public and private sectors and members of the public.**

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SECTION 2: ENVIRONMENTAL MEDIA AND RESOURCES

INTRODUCTION

2.1. This Section of the Strategy will offer an overview of the environment, both as it is now and how it might evolve over the next 20 years on present trends, drawing on the recent statistical report *The UK Environment*[1] and other data. It will also contain a separate Chapter on the state of the environment in the UK's Dependent Territories.

2.2. Different Chapters will deal in turn with population issues; the effect of environmental factors on human health; and environmental resources. Where appropriate, the Chapters will also look at the UK's position in relation to the state of the world environment. For each of the main environmental resources, the Strategy will seek to establish whether the resource is being used in a sustainable way and to identify problems that may need to be faced over the 20 year period and opportunities for new initiatives.

POPULATION

2.3. The Strategy will review prospective changes in population (size, age structure, density and migration) and changes in household formation. The UK population has grown by 3% over the last 20 years and, on current trends, is predicted to increase by 4% over the next 20 years. Because of reducing average size of households, however, the number of households is increasing faster than this, and in England and Wales is projected to rise by 15% over the same period. This increase, coupled with improving standards of living, generates additional demand for natural resources such as water and fossil fuels and for the goods and services produced by industry and business, which in turn have an impact on the environment. It may also generate more waste products requiring disposal.

2.4. The Strategy will also need to review shifts in the geographical distribution of the population within the UK. Where population is increasing, there will be additional pressures on water supply, on the supply of land for housing, shops, industrial development and the associated infrastructure of roads and sewerage systems, and on the natural landscape used for leisure and recreation.

HEALTH AND ENVIRONMENT

2.5. Economic development generates the wealth needed to improve health care. But the quality of the environment is also an important influence on health. Some of the linkages were reviewed in the 1992 White Paper *The Health of the Nation*[2].

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[1] *The UK Environment*. Department of the Environment. HMSO. 1992.

2.6. The Department of the Environment is developing and maintaining a series of data on the main forms of pollution of the atmosphere, water and land. Adverse health effects can sometimes be linked clearly to specific pollution incidents; it is more difficult to establish causal links between health effects and poor environmental quality generally, particularly in the case of long term, low level contamination. This is an important area for research.

2.7. The World Health Organisation (WHO) in its *Health for All by the Year 2000*[3] document has laid down a set of environmental health targets, each with associated indicators. The targets cover policy, environmental monitoring, control of air and water pollution and of hazardous waste, food safety and human settlements and housing. Not all of these targets are appropriate to the UK, but this Chapter of the Strategy will review the UK's position in relation to relevant WHO targets and the following Chapters will identify areas where pollution of resources may have health implications.

GLOBAL ATMOSPHERE

2.8. The main sustainability issues affecting the atmosphere are the need to contain emissions of greenhouse gases in view of their potential effect on the climate, and the need to phase out the use of chlorofluorocarbons (CFCs) and halons and to reduce as far as possible other ozone depleting substances.

2.9. Greenhouse gases are an important component of the atmosphere. They allow the sun's radiation to penetrate to warm the earth's surface, but trap part of the reflected heat, acting as a blanket and keeping the earth some 33°C warmer than it would otherwise be. Since the Industrial Revolution, however, people have been adding increasing amounts of greenhouse gases to the atmosphere, mainly by the release of carbon dioxide (CO_2) through the use of fossil fuels and the destruction of forests. There is a significant risk that this will lead to a warming of the global climate. Over the next two decades under present policies, atmospheric concentrations of greenhouse gases are expected to increase by almost 20%. Our knowledge of the effect on the climate of this increase is currently limited - for example, estimates of the resultant temperature increase differ by a factor of three. However, in about 10 years we can expect clearer evidence of man-made climate change, and a more reliable description of its likely regional impacts. Given the potential seriousness of global warming, however, a precautionary approach is required which would make us better placed to respond to the future challenge of climate change.

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[2] *The Health of the Nation - a strategy for health in England.* CM 1986. HMSO. July 1992.

[3] *Global Strategy for Health for All by the Year 2000.* World Health Organisation. HMSO. 1981.

2.10. UK emissions of the most significant greenhouse gas, CO_2, fell by 15% between 1970 and 1984 but have levelled out since then, mainly because of increased emissions from road transport as traffic has grown. Projections for the year 2000 range from 157 to 179 MtC (million tonnes expressed as carbon), compared with emissions in 1990 of 160 MtC.

2.11. The Government said in the 1990 White Paper on the Environment that it was prepared to adopt a target of returning UK CO_2 emissions to 1990 levels by 2005 if other countries took similar action. Under the Framework Convention on Climate Change[4], the UK, along with other developed countries, will be committed to action aimed at returning its emissions of individual greenhouse gases to their 1990 levels by the year 2000. There will remain the question of whether targets should be established beyond the year 2000 and, if so, how they should be achieved. Current projections suggest that it will not be easy to contain emissions at these levels, let alone reduce them after that date, as economic growth continues and factors such as the potential growth in road traffic come into play. New technologies and innovatory approaches will therefore be needed. UK emissions represent only a very small percentage of the global total, so action by the UK alone will have little impact. Global effort by all nations is required.

2.12. Internationally coordinated research is under way aimed at quantifying the Convention's objective of stabilising greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous interference with the climate system, and of ensuring that this level is achieved within a time frame sufficient to allow ecosystems to adapt naturally. Detailed consideration of these issues will be contained in the Climate Change Plan being produced this year.

2.13. The ozone layer protects the earth from harmful ultraviolet radiation emitted by the sun and any significant reduction in ozone concentration in the stratosphere could have serious consequences for life on earth. Consumption of ozone depleting substances such as CFCs and halons has been declining in the European Community (EC) and the world since 1987. Under the Montreal Protocol[5], production of halons is to be phased out by 1 January 1994 and production of CFCs, carbon tetrachloride and methyl chloroform by 1 January 1996. In the EC, phaseout of CFCs and carbon tetrachloride has been brought forward to 1 January 1995. The Protocol also controls hydrochlorofluorocarbons (HCFCs), hydrobromofluorocarbons (HBFCs) and methyl bromide. The Government hopes to agree tighter controls within the EC on HCFCs and methyl bromide later this year. A measure of the potential damage to the ozone layer is given by the total amount of chlorine and bromine in the atmosphere. On present estimates, concentrations of chlorine and bromine loading in the atmosphere will reach their peak by 2000. However, many uncertainties remain about the relationship between chlorine and bromine concentration and stratospheric ozone levels. It is not, therefore, possible to predict what levels of ozone depletion are likely at the turn of the century, and how urgent it would be to recover from that situation.

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[4] The Framework Convention on Climate Change was signed at UNCED in 1992 by over 150 countries.

[5] The Montreal Protocol on Substances that Deplete the Ozone Layer was first agreed in 1987. Since then, it has been revised twice, most recently at Copenhagen in November 1992. There are now over 100 parties to the Protocol.

2.14. The concentration of chlorine in the atmosphere is relatively little affected by changes in emissions between now and 2000 because of the length of time CFCs persist unchanged. However, the rate of decline of chlorine concentrations after 2000 will depend on the level of emissions over the next decade. On the basis of the controls agreed at the November 1992 meeting of the parties to the Montreal Protocol, the chlorine/bromine loading is expected to be around today's levels in 2012. There is limited scope for further tightening of the controls on those ozone depleting substances which have long atmospheric lifetimes, such as CFCs and halons. The controls on HCFCs and methyl bromide could, however, be tightened as technology develops although such action must proceed by agreement on a global basis.

AIR QUALITY

2.15. In considering sustainability, the main issues in relation to air quality are controlling emissions of harmful substances, particularly those produced by road transport, and protecting ecosystems by continuing the reduction in emissions which cause acid rain. The Strategy will need to consider the potential impacts of air borne pollution not only in the UK but also through transboundary movements on other countries, such as the Scandinavian bloc.

2.16. Air pollution can affect human health and amenity and damage vegetation and buildings. Some substances emitted into the air are directly harmful. Others react with each other in the atmosphere to produce harmful substances such as ground level ozone. Some pollutants eventually come down to the ground as acid rain and may add to the natural acidity of soils and freshwaters where the underlying geology is sensitive. This can harm plant life and lead to changes in the balance between species, including fish and the birds and animals that feed on them. The level at which ecosystems are judged to be at risk is called the "critical load". The Department of the Environment has formed a Critical Loads Advisory Group which has produced maps of critical loads for soils and fresh waters. Further study is necessary to relate ecosystem responses to measured acid depositions.

2.17. Many polluting emissions from homes and industry have reduced over the last 20 years. Since 1970, emissions of sulphur dioxide (SO_2), the main contributor to acid rain, have fallen by 45%, and black smoke emissions by almost 70%. They will fall further over the coming years as implementation of existing UK and EC controls is completed. The UK is committed under EC legislation to reducing SO_2 emissions from large combustion plants (LCPs) by 60% by 2003, compared with the 1980 level. Emissions from LCPs, mainly power stations, currently account for around 83% of the total. By 1991, a 23% reduction in LCP emissions had been achieved. Under the latest emissions scenarios, the reduction in SO_2 emissions from LCPs is projected to reach the 60% target by 2003. Longer term objectives for SO_2 emissions are currently being reviewed in the negotiations to revise the Long Range Transboundary Air Pollution agreement for the whole of Europe.

2.18. While industrial and domestic air pollution has been declining, there has been a substantial growth in air pollution from motor traffic - for example, vehicle emissions of nitrogen oxides (NO_x) and smoke have both increased by over 70% since 1980. The tighter emission standards introduced in 1993 for new vehicles, particularly petrol-engined vehicles, together with tighter checks on older ones, should reverse this trend and lead to a steady general improvement in air quality to the end of the century and beyond. However, there are still likely to be some episodes of high pollution levels in our cities since catalytic converters on cars are not effective until they are warmed up and the weather, particularly in winter, can trap the pollution close to ground level. There will, too, still be some days of high ozone levels in summer and diesel smoke will remain a year round problem.

2.19. Looking further ahead, the introduction of new, cleaner power generation technology should have dealt with the main sources of acid rain in the next 10 to 20 years, leaving a few highly sensitive, naturally acidic upland areas in Northern England, Scotland and Wales still at risk according to model calculations. If traffic growth continues in line with current projections, emissions of NO_x and smoke from vehicles could start to increase again unless other measures are taken. New cost effective technological improvements, coupled with measures to reduce the impact of transport, especially in urban areas, will be required to avoid renewed growth of most polluting emissions towards the end of the period covered by the Strategy.

WATER

Freshwater

2.20. This Chapter of the Strategy will consider the way in which the water environment is managed. The main issues are the increasing demand for water and the consequences, particularly in terms of investment and land take for reservoirs; the options available to meet or contain the demand; the potential threats to water quality, and the various measures to be taken to protect it.

2.21. Nationally, demand for treated water from the supply system is increasing. In some English regions, resources are already intensively used. In 1990, there were localised shortages in the Thames and Southern regions, caused by a notable drought occurring in an area where resources so far developed exceeded demand by less than 5% overall. The effect of the drought combined with historically high abstraction rates caused some temporary lowering of the water table, the drying up of some stretches of rivers, and a deterioration in river water quality, because of reduced effluent dilution. Demand projections have been made up to the year 2021, and they indicate increases in demand in excess of 8% in all regions of

England and Wales except in the North West. Demand is projected to increase by around 40% or more in the South West, Wessex and East Anglia.

2.22. Many factors affect water quality of which some of the more important are discharges from sewage works, industry and farms, as well as the more arbitrary effects of weather conditions. In 1990, 89% of river length in England and Wales, 97% in Northern Ireland and 99% in Scotland was considered to be of good or fair quality. In England and Wales, there was a slight net overall decline in reported water quality between 1985 and 1990, thought to be due to improved monitoring, low rainfall and discharges from sewage works, industry and farms.

2.23. Although overall river quality is reported, results are also studied from more detailed monitoring of particular parameters. Many contaminants in freshwater are below the limit of detection, or their concentrations fall well within the accepted safety limits in most parts of the country. So far as nitrates are concerned, overall levels have remained broadly constant over the last decade. Nevertheless, nearly 85% of the 200 or so rivers monitored in Great Britain at or near their tidal limits had nitrate levels complying with the EC Nitrate Directive limit for surface waters (50 milligrams per litre). As regards phosphorus, while levels of orthophosphate are increasing in many English regions (for example, Severn Trent, Anglian and Thames) problems of eutrophication (nutrient enrichment by nitrogen and phosphorus which can cause an accelerated growth of algae and higher forms of plant life) are still rare at present. About 75% of phosphate in rivers comes from domestic sewage and about 20% from agriculture.

2.24. Substances like heavy metals and pesticides, which can build up in living organisms, are important in the context of sustainability. Concentrations of such substances are generally very low and often fall below the limit of detection of current analytical techniques. Where they have been detected, they are normally well within environmental quality standards, although high concentrations of some substances have occurred at times in a few rivers, for example, various heavy metals in the Rivers Carnon and Red in Cornwall and the now banned pesticide Dieldrin in the River Aire in Yorkshire in the late 1970s and early 1980s.

2.25. Acidification of surface waters is likely to decrease as sulphur depositions are expected to reduce, but some sensitive areas will continue to be at risk into the 21st century. It is estimated that by 2005, sulphur deposition will still exceed freshwater critical loads in about one-sixth of the surface area of GB, particularly in upland Wales, the North of England and Scotland, even if current planned reductions in SO_2 are achieved.

2.26. The quality of groundwater is important particularly in the longer term. In England and Wales, groundwater is an important source for drinking water, accounting for 30% of abstractions for the public water supply and as much as 75% in some areas. Groundwater quality is hard to monitor; it is particularly susceptible to diffuse pollution, which is harder to control than pollution from point sources. Once contaminated, it may take many years before the groundwater recovers even when the source of pollution has been removed. Because of the difficulties and high costs involved, any remediation of past contamination of groundwater would need careful prioritisation. For the longer term a key issue will be to establish priorities, targets and methods for the adequate protection of groundwater.

The Sea

2.27. The key issue is the impact of inputs of persistent contaminants on the sea around us. These may be direct, or via rivers or by deposition from the air. Recent reports on the North and Irish Seas indicate that environmental problems are confined only to specific areas, such as the German Bight, the Wadden Sea and Liverpool Bay.

2.28. Generally, contaminant inputs from the UK to marine waters are declining, reflecting tighter controls, including the phasing out of industrial waste dumping at sea, and better treatment of sewage and industrial effluent. For example, direct and riverine inputs of mercury to marine waters around the UK are estimated to have fallen from 27 tonnes in 1985 to 11 tonnes in 1991.

SOIL

2.29. The quality of a nation's soils is one of the most important natural capital assets passed on to a future generation. Reflecting the importance of this area, the Royal Commission on Environmental Pollution is about to undertake a study of all sources of soil damage in the UK. Soil can be lost, degraded or improved by natural processes and by human activities. Agriculture has a significant role to play in maintaining sustainable soils; farmers have a direct incentive to look after their soil because that is the basis of their future income. Although surveys have indicated that about one-third of arable land in England and Wales is theoretically susceptible to wind or water erosion, the losses actually experienced or expected are small in a national context.

2.30. Use of sewage sludge on agricultural land as a soil conditioner and fertiliser is one source of heavy metal addition to soils. Currently, about half of all domestically produced sewage sludge is used for agricultural purposes and metal additions are closely controlled to avoid adverse effects. The quantity of sludge reused in this way is expected to increase with the implementation of the EC Urban Waste Water Treatment Directive and the banning of disposal at sea by 1998. In some areas, industrial decline has left a legacy of contaminated soil which causes serious, but localised, problems.

LAND USE AND LAND COVER

2.31. The issue here is how to reconcile conflicting demands and pressures for a finite supply of land in the UK. About 77% of the UK is covered by agricultural land, around 10% by forest, and just over 10% by urban land.

2.32. Agricultural land management is essential for the maintenance of the quality of the environment, but some farming practices can have an adverse effect. During the last decade the Government has increasingly deployed a combination of incentives, deterrents and advice to encourage farmers and other landowners to practise methods which avoid environmental damage and deliver environmental benefits. Last year's reform of the EC's Common Agriculture Policy (CAP) provides for a package of "agri-environment" measures. This and other aspects of the reform package should reinforce the more recent trend to lower use of agrochemicals. Government policies are also working to avoid land abandonment by farmers in more marginal areas and to ensure that the land is managed in an appropriate way.

2.33. Forestry has many uses and benefits: it provides timber and many other woodland products; it provides valuable landscape and recreational features; and it provides habitats for animals and other life forms. Forests also help in a modest way to absorb emissions of CO_2. The bulk of UK demand for wood and wood products is met by imports from other countries, notably Scandinavia, North America and the former Soviet Union. Only 10% comes from forests in this country.

2.34. The area of the UK covered in forest has more than doubled from 1.1 million hectares in 1919, when the Government established the Forestry Commission, to over 2.4 million hectares in 1993. Even so, only 10% of the land surface in the UK, and only 7% in England, has tree cover, compared with an average of 25% in the EC. The post war expansion of forestry was largely achieved on marginal agricultural land, mainly in the uplands, often involving the planting of productive conifers native to the North West coast of North America and well suited to our climate. Coniferous forests increased from 0.4 million to 1.5 million hectares between 1947 and 1991, leading to concern about their impact on the landscape and on the ecology of semi-natural areas. From the early 1980s, the planting of broadleaved trees has been given strong encouragement, reflecting concern at the adverse environmental impact of some conifer planting and coinciding with the availability of better quality agricultural land for alternative uses.

2.35. Nearly 20% of the UK is covered by special designations to help conserve its character and the natural features on which wildlife are dependent. These designations include National Parks, Areas of Outstanding Natural Beauty, National Scenic Areas and Environmentally Sensitive Areas. Around 1.8 million hectares of land in the UK are designated as Sites of Special Scientific Interest. Since 1981, the area of land so designated has increased by 33%. Currently, around 1% per year of these sites suffers damage which may be irreversible.

2.36. Changes in population and household formation are causing increased demand for housing and other development, with associated infrastructure. In 1981, 10.2% of the land area of England was estimated to be in urban use. This proportion had grown by around 50% since 1950. It has been projected that by 2001, the urban area will have increased to 11% of the total land area.

2.37. Changing patterns of industry have led to the decline of some former major manufacturing areas, which has left areas of vacant and derelict, sometimes contaminated, land. In 1990, it was estimated that there were around 60,000 hectares of vacant land in urban settlements in England, about 5% of the urban land area. Surveys identified 40,500 hectares of derelict land in England in 1988, and 8,300 hectares in Scotland in 1990. In Wales, there was estimated in 1992 to be some 6,000 hectares of derelict land, a significant proportion of which was already included in the land reclamation programme of the Welsh Development Agency.

2.38. The Derelict Land Survey of England is being revised and updated in 1993. Results should be available early in 1994 and will show whether derelict land is continuing to be reclaimed faster than it is being created. Responsibility for grants to tackle dereliction in England is passing to the new Urban Regeneration Agency. Recent independent estimates of the amount of contaminated land in the UK range between 100,000 - 200,000 hectares.

2.39. The projected growth in transport is likely to lead to increased demand for new roads. An estimated 14,070 hectares of land in GB (0.06% of the total area) was developed for highways and road transport between 1985 and 1990. Around two-thirds of this was previously agricultural, semi-natural or uncultivated land or forest.

2.40. In respect of the built heritage, there is concern over the impact of environmental pollution, in particular acid rain. Studies of stone decay indicate that there is greater erosion where average SO_2 concentrations are higher. But typical urban SO_2 concentrations are now 80-90% lower than 40 years ago and probably lower than they have been for 200-300 years. Recent studies suggest that SO_2 now accounts for perhaps at most 10% of stone decay rates. There were some 440,000 listed buildings in England in 1991, an increase of 57% since 1981, over 39,000 listed buildings in Scotland and another 13,600 in Wales.

MINING, MINERALS AND FOSSIL FUELS

2.41. The issues are consumption and management of natural resources; the availability of stocks of finite resources in the longer term; and the environmental impact of minerals working and the overall quality of the environment affected by extraction.

2.42. A very wide range of minerals is worked in the UK. The main ones are aggregates for use in construction (sand and gravel and crushed rock) and coal. Other significant minerals include limestone, igneous rock, sandstone, common clay, shale, and also gypsum, salt, potash, china clay, specialist clays (for example, ball clay), industrial sand, slate and vein minerals (fluorspar, barytes and some metalliferous minerals).

2.43. The UK exports some minerals and mineral-based products, largely ball clay, china clay, aggregates and coal. The value of exports was £274 million in 1991.

A wide range of minerals and mineral-based products are imported, valued at £1.4 billion in 1991. For aggregates, the trade is very small - less than 1% of total UK production and consumption over the period since 1985. Over the last two years, exports of aggregates to other European countries have increased to approximately 2% of UK production.

2.44. Minerals make an essential contribution to national prosperity. But minerals extraction can have environmental impacts on local areas and communities (for example, noise, dust, visual impact, traffic). While sites can be restored to a high standard, it can take some time for restoration to mature. In addition, although a temporary use of land, workings can be concentrated in a locality for many years.

Aggregates

2.45. Demand for aggregates in the UK in 1991 was approximately 240 million tonnes. During the 1980s, demand increased by over 50%. Projections commissioned from consultants indicate that demand could significantly increase over the period to 2011. The Government believes that it will become increasingly difficult to identify extraction sites which are environmentally acceptable. It is therefore necessary to consider the potential contribution that can come from alternative sources.

2.46. Alternatives to land won aggregates include marine dredged sand and gravel. However, in practical terms, marine aggregates are a finite resource for which there is an increasing demand for coastal protection and beach recharge purposes. Moreover, the potential effects of marine aggregates dredging on fisheries and the marine environment require careful consideration.

2.47. Another option is waste/recycled materials. Currently, only 10% of aggregates requirements are met from such materials, and there is potential to increase this figure. But it needs to be recognised that some of the environmental impacts of working primary aggregates are also common to waste/recycled materials and that not all such materials are technically suitable for the required end uses.

2.48. The Government has recently completed a consultation exercise on revised planning guidelines. Recognising the concerns over the impact of minerals extraction, the new guidelines seek to identify how aggregates requirements should be met in a way which takes account of sustainable development principles.

Coal

2.49. In the last five years, opencast coal production in the UK has risen from 16 million tonnes per annum (mtpa) to 19 mtpa. Reserves remaining unworked in approved sites at the end of 1991-92 stood at 87 mt. Opencast coal is a low cost energy resource. It can be noisy, dusty and visually intrusive, but its extraction can produce landscape improvements, for example, through clearance of dereliction.

2.50. In the five years ending March 1992, UK production from deep mines fell from 82 mtpa to 71 mtpa and the number of collieries from 94 to 50. Future prospects for coal were reviewed in the recent White Paper[6]. The planning problems associated with deep mining are subsidence, disposal of wet and solid waste, visual intrusion, traffic and the lengthy duration of operations. The Government will be publishing a consultation paper setting out its future planning policy for coal - both deep mine and open cast.

WILDLIFE AND HABITATS

2.51. The changes in land use referred to earlier in this Section, such as increased urbanisation, industrial development and transport, modern agriculture practices, mineral extraction, and the resultant pollution of air, water and soil, all impact on significant areas of the countryside on which our wildlife depends. For example, the area of upland heather fell from 3481 km^2 to 2697 km^2 between 1940 and 1990; some 16% of hedgerows in GB were lost or reclassified to other boundary types between 1984 and 1990.

2.52. Virtually all the wildlife habitats in the UK exist on land managed by man. These habitats cannot preserve their present character and diversity unaided, even if the threat of directly damaging operations can be halted. Wide ranging action is therefore being taken to secure land management regimes that preserve and enhance habitat features and thus provide a vital support structure for wildlife populations.

2.53. The Government's aim is to contribute to the conservation of the diversity and abundance of our wildlife, and also to the maintenance wherever possible of individual species as viable components of their natural habitats over their natural range. Since the introduction of the Wildlife and Countryside Act 1981, the main focus of the Nature Conservation Agencies funded by Government has therefore been the identification and protection of the best examples of wildlife habitat within given areas. The Sites of Special Scientific Interest network has been re-evaluated and added to so that it now stands at some 5,600 sites totalling about 1.75 million hectares, some 8% of the land area of Great Britain. Within that network are sites of national and international importance such as National Nature Reserves (over 242), Special Protection Areas for Birds (230 identified as potential sites; 70 formally designated) and Wetlands of International Importance under the Ramsar Convention 1971 (63).

2.54. Most rare species of wildlife need effective protection against habitat loss if they are to survive or recover to more viable populations. Under the 1981 Act, 93 species of animal and 165 species of plant are protected. The dormouse, red squirrel, natterjack toad, Sussex emerald moth, strapwort and fen violet are examples of species for which special programmes are being developed to assist their recovery. With the exception of some bird species which may be hunted or killed because they are pests or because they are game, the rest are protected.

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[6] *The Prospects for Coal - the conclusions of the Government's Coal Review.* Cm 2235. HMSO. March 1993.

2.55. Some wildlife resources are, of course, exploited for their value as food or other resources. These must be managed in a sustainable way. Despite measures taken under the EC Common Fisheries Policy, there is considerable concern about over-exploitation of many fish stocks in the waters of EC member states.

2.56. Wildlife and habitat issues, including the international dimension, will be reviewed more extensively in the UK Biodiversity Plan which is being drawn up under the Convention on Biodiversity which was also negotiated at the Earth Summit last year. Separate consultations are under way on the Biodiversity Plan, which is to be published by the end of 1993. The Government would welcome comments on nature conservation as part of general responses to this consultation paper on sustainable development, but people with fuller observations to make on wildlife conservation and other aspects of biodiversity are encouraged to make them as part of the separate consultations on the Biodiversity Plan.

ENVIRONMENTAL INDICATORS

2.57. Earlier parts of this Section will have highlighted some of the key issues in considering whether the UK is on a sustainable path. It will have presented factual information on trends and on where this country stands in relation to targets which the Government has set and to international commitments. With such a wide range of issues to be considered, and frequently many different ways of measuring the position in relation to a particular issue, there is a need to consider how to make the best use of statistical indicators. There may be gaps in particular areas because of difficulties in measurement or interpretation. It might be helpful to focus particularly on a key set of indicators, measuring the main concerns, but not to the exclusion of all others.

2.58. Countries in the OECD have been leading attempts to identify a small set of broad indicators of environmental conditions. In 1991, OECD published a preliminary set of 18 environmental indicators, together with seven key indicators reflecting economic and population changes of environmental significance. These are still being developed.

SUMMARY

2.59. This Section of the Strategy on the state of the environment is likely to focus on the following main issues:

1) **the level of CO_2 emissions which are projected to rise in the longer term, and energy use;**

2) **the potential impact of local air quality on people's health including the particular long term threat of rising emissions from road transport;**

3) the increasing demand for water;

4) trends in water quality and potential threats to it;

5) the demand for more land for economic development;

6) potential threats to habitats and species;

7) the potential environmental impacts of increasing demand for minerals especially aggregates.

2.60. In considering these environmental issues, it will be important to keep in mind the underlying principles in Section 1. The Strategy should review:

1) environmental improvements which have been achieved through existing policies or which are expected to be achieved;

2) any areas of uncertainty in which there might be significant risks, such that further research or monitoring might be needed;

3) longer term objectives and priorities.

2.61. The Government would be interested to receive responses on these points.

SECTION 3 : ECONOMIC ACTIVITIES AND SUSTAINABILITY

INTRODUCTION

3.1. In this Section, the Strategy will consider what implications the objective of sustainable development might have for different sectors of the economy, such as agriculture, industry and transport, and some of the environmental problems and issues that can arise from economic development, such as wastes for disposal and contamination of land.

3.2. Each Chapter will also consider the international impacts of UK activity. The UK contributes to other countries' economies but places demands on their natural resources (through, for example, the domestic consumption of imported goods and tourism); in turn, other countries place demands on the UK's natural resources. Financial resource flows (official, private and direct investment) between the UK and the rest of the world affect the ability of other countries, especially developing countries, to pursue sustainable development policies. Social and cultural links, in particular with the Commonwealth, are also important factors in the UK's international "footprint".

3.3. The UK, like other countries, also has an impact on the "global commons", directly through emissions and our consumption of resources and, indirectly, in our efforts to support these global resources through international action. The Strategy will need to consider the balance between domestic and international action to address these global issues.

AGRICULTURE

3.4. Agriculture makes use of some 77% of the UK's land area. Our countryside and many of its wildlife habitats were formed by - and continue to depend on - agricultural cultivation and management. Since the war, UK agriculture has made great strides in achieving a secure supply of food and improving efficiency. It now provides three-quarters of the food we eat that can be grown in our temperate climate. It contributes 1.3% of our Gross Domestic Product (GDP). Increased agricultural productivity has meant that the number of people directly employed in agriculture has fallen by nearly 40% over the last 30 years.

3.5. In the last 20 years, a major stimulus to increasing UK production has been the EC Common Agricultural Policy (CAP). The CAP has, however, been costly for taxpayers and consumers. Other developed countries also subsidise agriculture, but the CAP was responsible for nearly £25 billion of the EC budget in 1992. Producers in developing countries have suffered from subsidised EC exports and from the EC's levy and tariff barriers.

3.6. The 1992 CAP reform package seeks to create a more balanced market both by reducing prices and by providing support which is not directly linked to production and which includes environmental benefits among its aims. The UK

Government played a full part in shaping the 1992 reforms and will continue to press for further reform to reduce the levels of artificial support and to integrate fully environmental considerations into the CAP. The Government will also maintain its firm support for a successful outcome to the current GATT round. This will encourage more rational use of resources and reduce trade distortions which damage the interest of producers in the developing world.

3.7. Because agriculture is such a major land user, developments in the industry can have considerable environmental effects. Changes in agricultural production patterns can lead to the loss of wildlife habitats and landscape features. Overgrazing is a problem in some upland areas. The disposal of farm wastes, particularly from livestock farms, can also give rise to problems, although the number of agricultural water pollution incidents has recently shown a decline.

3.8. In addition to its policies on CAP and GATT mentioned above, the Government has introduced a number of measures to encourage sustainable agricultural systems. These include regulations (for example, on the use of pesticides and the construction of farm waste stores); advice and Codes of Practice to help farmers in, for example, tackling farm pollution; research and advice on husbandry systems which minimise use of pesticides and fertilisers; schemes such as Environmentally Sensitive Areas and Countryside Stewardship to encourage environmentally positive farming; and proposed measures under the EC agri-environment regulation, including an expanded Nitrate Sensitive Area Scheme and incentives for organic production and restoration of moorland and other habitats.

FORESTRY AND URBAN TREES

3.9. Forests serve many purposes (cf para. 2.33 - 2.34). The Government's current policies encourage woodland planting and management to meet economic, social and environmental objectives. The receipt of government grants is subject to high environmental standards and strict safeguards. As an importer of forestry products including tropical timber, the UK influences forestry activities in other countries. Detailed consideration of forestry issues will be contained in the UK National Forestry Plan being prepared this year following the Statement of Forest Principles agreed at the Earth Summit.

3.10. Trees in towns are also an important resource which enhance the quality of our urban environment. As trees planted in previous decades age, and as declining populations in city areas create more vacant space, the need is highlighted for sound management of urban trees and for cost effective ways of greening urban spaces.

FISHERIES

3.11. There is widespread concern about the pressure on fish stocks in many parts of the world. Around 500,000 tonnes of sea fish are landed in the UK every year. Fish stocks are a renewable source and, by the very nature of the industry, have to be exploited in a sustainable way. The Strategy should look ahead, so far as possible, to the year 2012 and consider how far the fisheries and marine environment are on a sustainable path.

3.12. Fisheries within the waters of EC member states are managed within the framework of the EC Common Fisheries Policy (CFP). This lays down rules governing the quantities of fish which may be landed and technical conservation measures concerning, for example, the type of gear which fishermen use; and prescribes targets for the total size of member states' fishing fleets and the level of activity they deploy.

3.13. The UK has sought to ensure that the CFP is effective in its objectives of safeguarding fish stocks and the long term interests of the fishermen who depend upon them, and has also supported a recent revision of the CFP which has made clear that the policy must take account of the wider impacts of fishing on the marine environment. The Government has announced plans aimed at reducing total fishing effort by the UK fleet in line with our EC obligations and has also launched discussions with the industry to consider possible new technical measures to safeguard stocks.

3.14. A major development in the last decade has been fish farming for trout and, particularly, salmon. The UK salmon farming industry now produces some 40,000 tonnes of fish a year; it provides valuable and good quality employment in the remotest parts of Scotland, and in these areas makes a significant contribution to sustaining fragile rural economies.

MANUFACTURING AND SERVICES

3.15. Industrial development and protection of the environment were once viewed by some as incompatible. Today, however, it is widely recognised that industry, with its innovative and wealth creating ability, has an essential contribution to make to the solutions. Industry has a central role to play in determining how to balance development and the environment, and consequently many of the issues affecting industry will be covered in other Chapters of the Strategy. Multinational companies, in particular, who have the ability to move business activity between individual countries and have a significant effect on local economies, also have the opportunity to exert a strong influence on the environment in other countries.

3.16. Industry's environmental performance has greatly improved and will continue to do so; the Government now needs to review the way in which it encourages and supports this process. There is already a comprehensive body of UK legislation regulating industry's impact on the environment, including the Integrated Pollution Control system, which requires the use of best available technology not entailing excessive cost (BATNEEC).

3.17. The Government's approach is to introduce well targeted legislation where necessary to achieve minimum standards of environmental performance, but increasingly to use economic instruments as a more effective way of meeting environmental objectives. In this way, there is potential for environmental issues to play a role in the competitive position of the company: the market significance of these environmental factors needs to be assessed and brought to bear on business decisions in the same way as other determinants of competitiveness.

3.18. Industry is also voluntarily improving its environmental performance in response to pressure from the market. Companies are adopting best practice in areas such as energy efficiency, recycling and company transport and there is a growth in disclosure of environmental performance. Various voluntary schemes, such as the EC's eco-labelling and Eco-Management and Audit schemes and BS 7750, will work with market pressures and reward companies who perform well. Companies that fail to take account of the environment are likely to find the penalties of the market place severe. On the other hand, while some environmental measures save money, costs associated with new legislation and the introduction of new, clean technology can be a disincentive.

3.19. Pressure from the market, encouragement from the Government and peer pressure have encouraged industry to assume much of the responsibility for improving its own environmental performance. However, further work is required in areas such as corporate purchasing practice, environmental education and training and corporate environmental reporting. The financial sector and small firms have their role to play. There are many small firms and, while individually they may not be significant polluters, their combined pollution impact can be significant. It can also be more difficult to get individual firms to clean up their operations due, for example, to lack of awareness or to inadequate management and capital resources.

3.20. The issues of concern to industry include pollution emissions, energy consumption and supply of raw materials. Discussions about the extensions of liability for environmental damage have important implications for both business and its financial backers. Liability laws have the potential to increase the sensitivity of business to its environmental impact, but raise important issues for the financial sector in terms of asset valuation, investment and funding of remedial measures. The Government engages in strategic dialogue with industry on environmental matters and has already received advice on many of these issues from the Advisory Committee on Business and the Environment.

BIOTECHNOLOGY

3.21. Advances in biotechnology have great potential for wealth creation and for environmental benefit, for example, in developing new means of cleaning up pollution. The Government wishes to encourage the development of environmentally beneficial biotechnology products. To ensure environmental safety and public confidence in the new technology, controls have been introduced by the Government which are based on the principle that the degree of control should reflect the degree of risk. The Government has taken a lead in arguing for international guidelines on modern biotechnology safety based on the same principle, not only to promote appropriate safety measures, but also to encourage the uptake of products and processes which aid developing countries and have environmental benefits and to reduce the likelihood of barriers to trade in the products of biotechnology.

ENERGY

3.22. The environmental impacts of energy production and use vary with the type of energy source and the efficiency of production. They include the impact of emissions of greenhouse gases, sulphur dioxide and nitrogen oxides; the impacts of production and transport of fossil fuels; the impact of nuclear installations including disposal of waste; and the impact of some renewables on landscapes.

3.23. In the distant future, the depletion of fossil fuel resources may lead to a widespread change, both worldwide and in the UK, in the pattern of energy production towards non-fossil sources, of which nuclear and renewables are the only clearly established technologies today. But, in the period to 2012, resource depletion is likely to be a less significant factor than the environmental impacts related to the production and use of energy.

3.24. Economic development tends to lead to increases in energy consumption, although in the UK the linkage has not been strong. The average standard of living in the present territory of the UK, as measured by real Gross Domestic Product (GDP) per head of population, is roughly four times the level of 100 years ago; but over this period energy consumption per head has only risen by about 60%, and carbon dioxide emissions per head by around 15%. Changes in the structure of the economy, in the composition of industry and in fuel mix, together with substantial improvements in the efficiency with which energy is supplied and used, have contributed to this progress. Within the total of energy consumption, there have been significant increases in use by individuals, particularly for road transport, offset by reductions in use by industry.

3.25. There is considerable scope for reducing energy consumption by improving energy efficiency and in the short term, at least, this is likely to be the most cost effective means of limiting the environmental impact of UK energy consumption. Studies have shown that a potential reduction of 20% is possible through the widespread adoption of proven cost effective technologies and management techniques. The Government will, therefore, continue to promote energy efficiency in all economic sectors.

3.26. However, consideration will also need to be given to the balance of energy sources used in the economy. Generating stations have relatively long lifetimes so it is important to begin thinking now about the balance of capacity that may be available in the next century to meet the needs of sustainable energy use. These are issues both for the Government, which must set the framework, and for the generating industry which must take the investment decisions. The Government is about to begin a review of prospects for nuclear power and will shortly be publishing the results of its review of renewable energy sources.

WASTE

3.27. Waste disposal can cause damage to the environment, both in the short term and in the long term, particularly where waste contains harmful substances or gives rise to harmful emissions. Waste disposal can also mean the loss of resources that might have been reused or recycled. This Chapter of the Strategy is therefore likely to focus on two main issues: first, the scope to reduce the amount of waste generated, by promoting waste minimisation at source, through improved industrial and other processes, or by reducing consumption by reuse, materials recycling or energy recovery; and, secondly, on measures to secure safe disposal of the remainder.

Disposal

3.28. The UK produces around 400 million tonnes per annum of waste. Around one-third of total waste arisings (140 million tonnes per year) are controlled wastes[1], and around 120 million tonnes of this currently goes to landfill. The geology in some parts of the UK is suitable for landfill of controlled wastes when good site preparation and management techniques and methods are employed. But planning permission in some areas is becoming more difficult to obtain, sometimes in areas that have large arisings of waste.

3.29. In less suitable areas or where controls are not properly enforced, landfill can cause pollution through leachate entering groundwater, or through dangerous emissions. New arrangements for licensing and a more restrictive approach to planning permissions may therefore limit the supply of landfill sites near some of the major areas of waste arising. This may in turn tend to increase the price of landfill in such areas, and increase the relative attraction of alternatives such as incineration or recycling.

3.30. A proportion of controlled waste already goes to incineration. But incineration also has the potential to produce gaseous, aqueous and solid pollutants. With modern gas-scrubbing equipment, stack emissions can be controlled to a high degree, and hazardous waste incinerators (and after 1995, municipal waste incinerators) will have to meet strict limits on permitted pollutant levels. The bottom ash from incinerators can contain heavy metals, especially when from municipal wastes, and fly ash from the gas cleaning equipment can carry a high load of contaminants. Ash must, therefore, be treated or landfilled with caution. The gas scrubbers also generate a contaminated aqueous effluent which must be treated before discharge, and the treatment process itself generates further solid wastes.

3.31. Around a quarter of all wastes derive from mining and quarrying. These wastes are generally either backfilled into excavations (as part of the restoration of the related mineral void or in other landfills) or are tipped as spoil heaps. In

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[1] Controlled wastes - household, industrial and commercial wastes under Part II of the Environment Protection Act 1990.

1988, there were almost 14,000 hectares of mineral spoil tips in England which had not been restored, although the requirements of the planning permissions should ensure future restoration of about 40% of this total. Most of the tips were from deep mined coal or china clay workings. British Coal has estimated that there was some 2000 million tonnes of colliery spoil on 560 tips in England and Wales in 1990, mainly in Yorkshire, Nottinghamshire and South Wales. The stockpile of china clay waste is estimated at over 600 million tonnes, increasing at a rate of 25.5 million tonnes per year. Slate waste volumes are estimated at between 400 - 500 million tonnes, with about 6 million tonnes being generated each year.

3.32. Sediments dredged from harbours, estuaries and approach channels account for around 11% of total waste and are normally dumped at sea. They contain trace metals, a substantial proportion of which are of natural origin, washed down into harbours and estuaries by rivers or originating in the sea. Although the total amount of metal arising from the dumping of dredged material at sea appears to have declined between 1986 and 1990, this reflects a reduction in dredging activity. The quality of dredged material, in terms of contaminant concentrations, may be expected to improve with the implementation of nationally and internationally agreed controls.

3.33. Currently some 10 million tonnes (wet weight) of sewage sludge and 3.5 million tonnes of minestone per year are also dumped at sea. The UK is committed to ending sea dumping of such material during the 1990s and alternative means of disposal will have to be found. The amount of sewage sludge is expected to increase as a result of the implementation of the EC Urban Waste Water Directive and the amount spread on agricultural land is, therefore, likely to increase.

3.34. Arisings of special wastes[2] have increased from 1.6 million tonnes in 1986-87 to 2.9 million tonnes in 1991-92. Movement and disposal of these wastes is controlled through a system of consignment notes. Most special waste is landfilled, though often after some form of treatment to render it less dangerous. Approximately a further 45,000 tonnes of hazardous waste is imported into the UK for disposal. Although the amounts involved are relatively small, this issue is of particular public concern. The 1989 UN Basel Convention on Transboundary Shipments of Waste has introduced global controls on waste movements.

3.35. There is also particular concern about the need for safe, long term disposal sites for radioactive waste and about the effects of long term, low level radioactive discharges, particularly into the sea. Discharges of radioactive materials to the sea have been declining. In 1980, for example, 3000 TBq (tetrabecquerels) of caesium 137 was discharged, but in 1990 this had been reduced to 24 TBq. About 80% of solid radioactive waste arising annually is low level waste, and is disposed of in shallow sites. The main disposal site is at Drigg in Cumbria. In 1991, 25,000 cubic metres of waste was disposed of at Drigg, about one-quarter of the volume disposed of in 1980. High level waste is stored at Dounreay and Sellafield for at least 50 years. The volume of stocks is increasing at around 5% per year, and amounted to around 1,700 cubic metres at the start of 1991. Intermediate level waste is currently stored at nuclear sites awaiting disposal in the deep disposal facility being investigated by UK Nirex Ltd. The volume of stocks is also increasing at around 5% per year, and amounted to around 50,000 cubic metres at the start of 1991.

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[2] Special wastes - wastes controlled under the Control of Pollution (Special Waste) Regulations 1980. SI 1980/1709.

Recycling

3.36. Recycling is already well established in the UK for some materials. Around 40% of the ferrous metal and copper used comes from recycled material, as does 33% of paper and over 20% of glass. Most of the material which is recycled comes from industrial and commercial sources. However, it is estimated that at least 50% of household waste could also be recycled. The UK currently recycles about 5% of household waste; the Government's target is to increase this percentage to 25% by the year 2000.

3.37. Recycling is highly dependent on the availability of markets for the materials which are collected. Recent measures in Germany to pass on the cost of recycling to manufacturers of packaging resulted in an increased supply of materials for recycling on the international market; this in turn has had adverse effects on the UK's efforts to increase recycling. Measures to deal with this problem are currently being developed.

CHEMICALS

3.38. The Government's objective is to ensure that there are adequate national controls and international agreements to protect people and the environment from risks when substances are released into the environment. The greatest threat to sustainability arises from chronic effects resulting from long term exposure or from repeated short term exposure. The best available scientific and other information is used to assess the risks and to decide what action is appropriate.

3.39. Two examples where successful actions have been taken to remove identified threats are the measures introduced in 1986 and 1987 to control the sale for use on small boats of paints containing tributylin compounds, and measures taken over several years to reduce exposure to lead, such as the introduction of unleaded petrol, treatment of water supplies and tighter controls on lead in food.

3.40. A more precautionary approach is adopted towards the most toxic chemicals. Thus pesticides are subject to a positive approval procedure based on detailed risk assessment before being allowed on the market. A more systematic and precautionary approach is being introduced for other types of chemicals. New chemicals are already assessed for possible risks to people and the environment before coming on to the market in the EC. A similar assessment procedure has been introduced recently for chemicals already on the market. The Government is committed to developing the ability to detect potential problems earlier and taking preventive action. Particular attention will be given to chemicals which are toxic at low levels of exposure, are persistent in the environment or have the potential to bioaccumulate in plants or animals. Other countries share the UK's concern and are participating with the UK in international programmes to share the burden of assessing the risks from chemicals.

CONTAMINATED LAND

3.41. As an early industrial nation, the UK has a burden of land contamination. In many cases the current owner was not directly responsible for causing the contamination and might indeed be unaware of it. This raises complex issues of civil liability.

3.42. The Government's policy is to ensure that land contamination does not give rise to unacceptable risks to human health and safety or to the environment, and to ensure that vacant urban and industrial land is returned to good use wherever practicable. The Government has set up a wide-ranging review of the powers and duties of public authorities to deal with contaminated land.

3.43. A programme of research is also in hand to develop guidance on the assessment and treatment of contaminated land. Projects cover aspects of the identification of contaminated land, guidelines for investigating sites and assessing risk, reviews of and guidance on treatment techniques, and monitoring and quality assurance.

TRANSPORT

3.44. An effective, modern transport system is an essential ingredient of economic development, but the growth in transport - especially road transport - has a major adverse impact on parts of the environment. The transport sector is exhibiting strong growth in demand. That growth arises partly from the growth in the economy, which allows an increase in car ownership and thus provides more freedom of mobility. This, in turn, leads to pressures on land use and dispersal of travel patterns. People value highly the convenience and mobility that cars give them but it is in this area that their individual decisions have perhaps the greatest impact on the environment.

3.45. This Chapter of the Strategy will seek to define the components and objectives for a sustainable transport policy, looking to both the short and long term. As now, objectives will need to be consistent with national policies for carbon dioxide and nitrogen oxides emissions; for reducing the impacts of traffic in town centres and villages; and for the protection of sensitive areas from damage from new infrastructure.

3.46. The Chapter will look at the relationship between transport infrastructure, development and the generation of traffic and at the country's future transport needs and how these can best be met. It will also look at the range of measures which could contribute to reduced impacts from the sector, including fiscal and market measures to increase the price of transport and reflect wider costs; regulations, such as additional vehicle standards or better speed enforcement; land use changes to improve accessibility and reduce the need to travel; traffic management and public transport improvements.

DEVELOPMENT IN TOWN AND COUNTRY

3.47. The UK will continue to need new development. Current trends suggest that over the next 20 years there will be a 15% increase in the number of households. Some of those households will be accommodated in conversions of existing buildings. Some will require new building. The changing society and economy in the UK will also give rise to other development needs. Fresh locations for development will also emerge, for example, to take advantage of infrastructure investment or of closer links to Europe.

3.48. The concentration of development on already built-up land will be an important consideration for future policy in this area. The Strategy will discuss the likely changing pressures on land (for example, from changing social and industrial patterns) and the likely limitations to the reuse of derelict and otherwise blighted sites, and what more could be done to make them available. It will also examine the competing claims for development in the countryside and the potential for sustainability offered by a variety of settlement patterns.

3.49. Urban development has to be seen in relation to topics considered in other parts of this Strategy, for example, on transport and business. Much of today's urban structure will endure well into the next century, and measures may be needed to make the way those buildings are used more sustainable. Equally, the decisions taken today on where and how to build will have long term effects.

3.50. Thus sustainability should influence choices about the scale, density, form, type and location of new development, as well as about the siting and design of individual buildings. The use of land for development, whether in urban or rural areas, and the energy resources that particular choices imply are particularly important considerations in this context.

3.51. The scale of new development clearly influences the land resources available to future generations. There is, therefore, an important choice to be made on how far the existing stock of buildings should be used more intensively and how far abandoned or under-used urban land should be recycled for new development. The density of towns is also an important factor. More compact urban development uses less land, and enables lower energy consumption through efficient generation technologies such as district heating and in the reduced need to travel, for example, from home to school. However, reductions in open space and in the provision of private gardens can reduce the quality of urban life, and encourage people to seek new homes in more dispersed locations. The size of towns is also relevant. Larger towns develop the critical mass that enables them to offer a variety of facilities locally, and reduces the need to travel to other towns for work, shopping or leisure.

3.52. However, appropriate new development in the countryside can often be necessary to help support local shops, schools and other facilities, and otherwise support the local economy. Changing communications technologies may reduce the need for routine journeys to work thus reducing the disadvantages of less compact forms of settlement.

3.53. The design and location of development can also influence the energy used within buildings and the amenity value of new development. Features such as the adaptability of new buildings to different uses and the ease with which the site could be returned to open uses at some time in the future are further important sustainable development considerations at this detailed level.

3.54. There are limits on what governments can achieve. It is for individuals to choose whether to live near where they work or in particular designs of houses. The key aim must therefore be to foster all that helps to improve the quality and variety of local urban life, so that people are encouraged to want to live in ways that are compatible with the aims of sustainable development.

TOURISM AND RECREATION

3.55. Increasing leisure time and more opportunities to take part in tourism and recreation activities are important aspects of an enhanced quality of life for most people. Tourism and recreation also contribute significantly to overseas, national and local economies. In 1990, tourism spending in the UK totalled £25 billion, having doubled in the previous decade. Tourism spending now represents nearly 5% of GDP and provides work for almost 1.5 million people - more than the Health Service or construction. Consumer spending on sports related items in the UK amounted to nearly £10bn in 1990 representing approximately 2% of GDP.

3.56. A number of local economies, for example, in the countryside and some historic towns now have tourism as their biggest element. The scale of such activities is growing; while the environment itself is often the primary attraction, there is recognition that unrestrained demand can cause lasting damage to a valued feature, such as a landscape or building, and, indirectly, to the general environment through, for example, increased traffic flows and inappropriate development. Sustainable development requires that the way in which tourism and recreation are developed to provide income and jobs and to satisfy the aspirations of individuals to enjoy leisure time is balanced by due consideration for the potential adverse impacts on the environment and the needs of local communities.

SUMMARY

3.57. Taking an area of activity in turn, each Chapter will:

1) outline the main characteristics and seek to identify trends and possible developments to 2012;

2) look at the pressures exerted on the environment and the positive contribution that can be made to the environment;

3) seek to identify areas of policy or practice where further information or research may be needed or to which further consideration should be given;

4) refer to and demonstrate the UK's response to the relevant chapter(s) of Agenda 21. [3]

3.58. The Government would welcome responses on each of these themes.

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[3] *Monitoring Progress on Agenda 21*. International Institute for Environment and Development/Department of the Environment. June 1993.

SECTION 4: PUTTING SUSTAINABILITY INTO PRACTICE

INTRODUCTION

4.1. This Section of the Strategy will concentrate on the processes by which the UK can pursue the aim of sustainable development, both for itself and as a member of the international community. It will review the part that can be played by different bodies and different people in the UK: the Government has a major role, but, as Agenda 21 emphasises, the role of others is at least as important. The Strategy will also consider the instruments available for policy making and voluntary action.

ACTORS

4.2. Agenda 21 emphasises that sustainable development is by no means the concern of central governments alone: local authorities, business and industry, trade unions, farmers, non-governmental organisations, the scientific and technological community and individuals all have a role to play in responding to the challenges of sustainable development. Their roles are complementary.

INTERNATIONAL INFLUENCES

4.3. Agenda 21 sets out a broad framework of action for sustainable development. Several UN Conventions and other international agreements, including GATT and EC legislation, impose more specific obligations and responsibilities on the UK in a number of areas. For example, the UK's environmental responsibilities in a global context include international conventions such as the 1973 Convention on International Trade in Endangered Species (CITES) and the Climate Change and Biodiversity Conventions. The EC has legislated extensively on environmental matters; and in its Fifth Environmental Action Programme has set out a European framework of action towards sustainability[1].

4.4. The UK Government is only one player in a complex system of a number of individual countries each pursuing their national interest and, at the same time, seeking to influence collective international behaviour. National governments need to be aware of the effects of their policies and programmes on the global environment, and on other countries' economies and environments, and to recognise the potential impact of other countries' actions on this country. Just as the behaviour of the UK Government is influenced by and can influence the economy and the environment of other countries, so sectors of the UK economy can have an international dimension which may need to be considered in the Sustainable Development Strategy.

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[1] *Towards Sustainability - a European Communities programme of policy and action in relation to the environment and sustainable development*. Official Journal of the European Communities No C138/5. May 1993.

CENTRAL GOVERNMENT

4.5. The Government attaches great importance to Agenda 21 and to the integration of environmental concerns into all its decision making. Building on the annual series of White Papers on the Environment, recent initiatives include the establishment of a new Ministerial Committee on the Environment, the nomination in each department of a "Green Minister" especially responsible for the environmental aspects of policies, and guidance on environmental appraisal of policies[2].

LOCAL GOVERNMENT

4.6. Local government is developing its own policies and programme responses to many of the issues raised in Agenda 21 through its own Local Agenda 21 initiative[3]. Some local authorities are already seeking to build environmental considerations systematically into all the services they provide and functions they discharge. Action to follow through Agenda 21 will need local partnerships, with local authorities setting objectives and targets and involving the local community in determining local environmental priorities and providing opportunities for practical action.

4.7. Central Government welcomes this new initiative; the Central and Local Government Environment Forum enables consultations to take place at senior level between central and local government. The new Eco-management and Audit scheme for local government is a recent joint initiative which will assist local authorities to assess and improve their performance.

VOLUNTARY ACTION BY INDUSTRY

4.8. Manufacturing and service sector businesses are increasingly adopting a strongly positive attitude on environmental issues in response to pressures from domestic and international markets, from staff and from the general public. British industry is pioneering a new environmental management initiative in the form of BS 7750. Several other countries have introduced voluntary agreements between the government and particular industrial sectors committing industry to specific levels of environmental improvement; there may be scope for comparable arrangements in this country.

4.9. In agriculture, the Government encourages farmers to follow best practice and to produce environmental benefits on a voluntary basis: it has published Codes of Good Agricultural Practice and provides free conservation and pollution advice.

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[2] *Policy Appraisal and the Environment - a guide for Government Departments*. Department of the Environment. HMSO. 1990.

[3] Including *Agenda 21. A guide for local authorities in the UK*. The Local Government Management Board.

There may be scope to expand education in agricultural practices. It might also be possible for the agriculture industry as a whole to agree voluntary environmental objectives relating to, for example, energy efficiency and pollution incidents.

VOLUNTARY ORGANISATIONS

4.10. The UK has a vigorous and independent voluntary sector, with many environmental voluntary groups. Their activities range from practical work, education and information provision and lobbying of Government through to fund raising. This Chapter of the Strategy will consider how the environmental voluntary groups can contribute both directly and indirectly to sustainable development in this country and internationally; the way in which the non-environmental voluntary groups might become involved; and the way in which the voluntary sector can work alongside central and local government and the business sector on environmental concerns.

4.11. This Chapter will also review the way in which voluntary organisations have participated in the preparation of this Strategy and will consider what participation arrangements might be appropriate in future.

THE GENERAL PUBLIC

4.12. Environmental issues are high on the public's agenda. Concerns range from local environmental problems such as litter, noise and dog control, to national issues such as pollution control and air quality, and to global threats such as the reduction of the ozone layer and climate change. People often want to know how to translate their concerns into action, whether to change behaviour patterns, how to exercise environmental choice in the market place and how to take practical action on the ground to improve their local environment.

4.13. The Government already provides information for the general public on many key environmental concerns. The Environment Protection Act 1990 and other recent legislation provided new environmental rights in England, Scotland and Wales, particularly on access to environmental information held by public authorities; the model local environment charters to be published this year will set out these new environmental rights in a more accessible form.[4] The EC Eco-labelling Scheme gives the public as consumers information to make informed decisions based on environmental considerations.

4.14. This Chapter of the Strategy will consider how best to disseminate information about sustainable development and to encourage people to weigh economic and environmental concerns in their everyday activities.

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[4] The Environmental Protection Act does not for the most part apply to Northern Ireland where separate legislation is being drafted. A local environment charter will also be published in Northern Ireland.

INSTRUMENTS

4.15. There are many ways in which central and local government seek to influence the attitudes and behaviour of organisations and individuals and to provide a lead in environmental stewardship. Some of these have already been referred to in Section 3 of this consultation paper in relation to activities in particular economic sectors; others cut across sectoral activities; most have an international dimension.

4.16. Environmental regulation has a role, but economic instruments can, in some cases, deliver environmental goals more effectively than direct regulation. Other instruments include purchasing policies of public and private sector bodies, environmental accounting, the land use planning system, education and training, research, and overseas aid and technology transfer. While prime responsibility for directing the use of these instruments may rest with central and local government, it is for business, voluntary groups and the public at large to take forward these messages and to translate them into action.

REGULATION AND ECONOMIC INSTRUMENTS

4.17. Regulation has traditionally been the main instrument which governments have used to combat pollution. But regulation is not always the most efficient way of proceeding. Economic instruments, which work with the grain of markets, can sometimes be a more flexible and satisfactory way of meeting environmental goals and can be used to promote sustainable development.

4.18. The essence of economic instruments is that they put a price on the use of the environment - if more use is made of the environment, the price to be paid rises. Where the environment is most under threat, prices can be highest giving a strong incentive to economy. By including in prices the wider cost of using the environment, both consumers and producers take account of the environmental implications of their decisions. Given the right market signals, they can do the job with less regulation and bureaucracy. In this way both a better environment and a more efficient economy are delivered with environmental objectives met cost effectively. This minimises the call on precious resources in the interests of sustainability.

4.19. Regulation will continue to be necessary in some cases, and is sometimes required by international agreements or legislation. The Government is, however, currently reviewing all existing regulatory mechanisms with a view to removing any unnecessary or excessively restrictive controls. For those that remain, the Government will be concerned to ensure that the environmental benefits justify the likely costs (taking account of the risks involved) and that the controls themselves are as streamlined as possible, consistent with achieving the intended goals.

4.20. Both regulation and economic instruments can raise questions about the burden on UK business in comparison with business in other countries.

International collaboration is vital to protect the "level playing field" and secure fair competition.

ENVIRONMENTAL ACCOUNTING AND APPRAISAL

4.21. Within the public sector, developments in environmental accounting could assist the integration of economic and environmental issues into decision making. National environmental accounting might comprise:-

a) natural resource accounts - looking at the stock and rate of depletion of natural assets such as coal or forests;

b) satellite accounts - accounts supplementary to the main national accounts in which for each sector the depletion of natural capital, environmental pollution and degradation, the production of waste, and the cost of environmental protection are quantified, in physical and/or economic terms;

c) green Gross National Product (GNP) - in which the traditional measure of GNP is adjusted to take account of the consumption of natural capital, environmental quality and the cost of environmental protection.

4.22. Such accounting principles have only limited application at present, not least because of the difficulties involved in deriving acceptable values for the many and varied aspects of the environment. But there are established techniques of cost benefit analysis. For example, the Government has developed a guide for assessing the environmental impacts of policy proposals or programmes when appropriate, and more recently it has developed tools for assessing the costs on business of compliance with new regulations. Work is under way in the area of risk analysis where scientific knowledge provides the underpinning for decision taking. Moreover, there are established procedures for integrating policy making between Government Departments, and the annual Environment White Papers are the public face of this. The Strategy provides an opportunity to consider whether further developments are required in these fields.

LAND USE PLANNING SYSTEM

4.23. The Government's objective for 2012 is to continue to make the best use of the land resource by maximising the use for development of urban land, especially where it is vacant, derelict or contaminated land, and protecting the open countryside and open land of importance in urban areas. The land use planning system will be the main mechanism to achieve this objective.

4.24. The principles of sustainable development are already explicitly recognised in the Planning Policy Guidance notes - through which the policies in development plans and individual planning decisions can be influenced. The planning system will deliver sustainable development objectives more readily once every area has an up-to-date development plan reflecting the latest planning guidance. Government guidance is for these plans to be subject to environmental appraisal as they are prepared.

4.25. All major development projects that are likely to have significant environmental effects must be subject to an environmental assessment before development consent is granted. Guidance is being prepared aimed at improving the quality of environmental statements and further guidance is proposed on the evaluation of environmental information.

4.26. It is important that local planning authorities should try to monitor the effectiveness of planning policies in delivering their objectives, including the objectives of sustainable development. This will become more important once plan preparation is complete and local authorities increasingly enter the implementation stage.

4.27. Public participation is a key element in the planning system - whether development plan preparation or decisions in individual cases. The 1991 Planning and Compensation Act improved consultation on applications in England and Wales. A current research project is looking at the effectiveness of local plan inquiries and a future project will examine ways of improving public participation in plan making.

EDUCATION AND TRAINING

4.28. Education has a vital role in developing the understanding, skills and values of future decision makers and in raising general awareness of environmental issues. For all schools and other educational institutions, this role extends beyond the formal curriculum to a responsibility for instilling responsible attitudes towards the environment in all their students.

4.29. Schools already show a great deal of enthusiasm for environmental education which figures in several subjects, such as geography, science and technology. This Strategy provides an opportunity to review ways in which schools can extend pupils' awareness of environmental issues and increase their respect for their natural surroundings.

4.30. Earlier this year the Toyne Committee published its report on environmental education in further and higher education (FHE). The report made a number of recommendations relating to specialist courses, updating skills of the existing workforce, and general environmental education across the curriculum which would help to promote concepts of sustainable development.

4.31. In Scotland, the Secretary of State established an Environmental Education Working Group, chaired by Professor John Smyth OBE. Its remit was to review the present provision of environmental education in Scotland and to propose a strategy for both formal and informal education. The Group's report, *Learning for Life*, makes many wide ranging recommendations.

4.32. Environmental training is part of the wider Vocational Qualifications programmes with a number of Lead Bodies involved. The Department of Employment is reviewing ways in which the interests of employers can be more effectively translated into vocational standards.

ENVIRONMENTAL TECHNOLOGY AND RESEARCH

4.33. New technology forms a vital part of any strategy to ensure sustainable development. It enables society to prolong the use of non-renewable resources by improving the efficiency with which they are transformed into the next generation's capital. It develops new renewable technologies and provides the means to afford repair of the damage from the past. Improving the quality of life is to be a mission statement in all six new UK research councils.

4.34. The majority of the reductions in polluting emissions that have been recorded over the last two decades have come through the application of new and imaginative pollution control techniques. With the advent of an integrated approach to pollution control, there is more opportunity to look at innovative solutions which address each pollution process as a whole. In some industries this approach has already led to dramatic decreases in the quantity of both natural resources consumed and waste produced. The availability of such technologies not only ensures future economic development but gives affordable tools for a precautionary approach towards the more hazardous substances. It is already clear that technology will be one of the main approaches to resolving key conflicts in sustainable development, such as traffic growth and other land uses.

4.35. It is only possible to know the state of the environment and to know whether this generation is passing on increased natural capital if it is possible to monitor and understand environmental conditions. The research has to be multi-disciplinary to understand all aspects of the environment and is increasingly international in its scope. In many cases, it requires research work at the very frontiers of knowledge.

4.36. The Strategy will consider how far current research meets the perceived pressure points of economic development and the environment and will seek to identify areas which need special attention in the forward look on science and technology.

OVERSEAS ASSISTANCE

4.37. As Agenda 21 makes clear, the main contribution to sustainable development will be from a country's own public and private sectors. The sustainable development strategies which countries themselves adopt will help to determine the way in which these domestic resources are used. The role for external assistance must be seen in this context.

4.38. There is a range of instruments which the UK can use to help other countries achieve sustainable development. These include Government policies, trade, financial flows such as private foreign investment and aid (including know-how). This Chapter will consider how the different instruments fit together; their respective merits in contributing to sustainable development internationally; and practical ways in which they could be made to work better.

SUMMARY

4.39. The Government would welcome responses to this consultation paper which:

1) **consider the part that different sectors can play in achieving sustainable development and the tools available to them;**

2) **identify ways in which the message of sustainable development could be developed and communicated to the general public to inform and to encourage changes in lifestyles;**

3) **consider the main instruments of policy making and voluntary action to encourage sustainable development.**

SECTION 5: CONCLUSIONS

5.1. Agenda 21 calls for national sustainable development strategies to be adopted and for reports on the implementation of Agenda 21 to be made to the new UN Commission on Sustainable Development. Countries are not expected to start from scratch but to build upon their existing plans and strategies: in the case of the UK this means particularly the 1990 White Paper on the Environment and the follow-up Reports in 1991 and 1992.

5.2. In preparing the UK Strategy, the Government will bear in mind the substance of Agenda 21 and its main recommendations. Some of the topics have limited or no direct relevance to this country and it will, therefore, be important to have a sense of priorities. The consultation process will help to identify and determine these priorities. The UK also has international responsibilities and obligations and the Strategy must take account of the potential of the UK's own behaviour to influence sustainable development in other countries and globally.

5.3. Agenda 21 also recommends that countries promote "an ongoing participatory process to define country needs and priorities in promoting Agenda 21". The UK Strategy for Sustainable Development will contain an account of the way in which it was drawn up and look at the way in which future consultation on sustainable development issues might be organised.

5.4. At this stage, it is too soon to formulate conclusions as to the outcomes of the UK Strategy. This consultation paper has, however, brought out a number of themes. Among these three main ones are as follows:

1) **The principles of sustainable development.** These have been discussed in earlier Government papers, and especially in the 1990 Environment White Paper. The Sustainable Development Strategy provides an opportunity to consider these underlying principles in more detail and to set out a fresh statement of them for reference in the UK.

2) **The processes for pursuing sustainable development.** There are well established processes in the UK for assessing the balance of interest between economic development and environmental protection, for policy integration and co-ordination, and for consultation. However, these should be reviewed and updated or improved where appropriate.

3) **Problems and opportunities.** There are both success stories and continuing concerns in the UK. The Strategy might therefore highlight problems and opportunities, review longer term objectives and identify priorities on which further work ought to be done.